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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
WANG, TED M

ART UNIT	PAPER NUMBER
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/677,058	TSUI ET AL.	
	Examiner	Art Unit	
	Ted M. Wang	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 27 November 2007.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-3,6-10,12-16 and 18-28 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-3,6-10,12-16 and 18-28 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, filed on 11/27/2007, have been fully considered but they are not persuasive. The Examiner has thoroughly reviewed Applicants' arguments but firmly believes that the cited reference reasonably and properly meet the claimed limitations.

Independent Claims 1, 12, 18 and 24

(1) *Applicants' argument* – "Also referring to Figures 6A and 6B of Kawanabe, relied upon by the Office Action, it can be seen that Kawanabe does not disclose that a composite signal is centered at a selected frequency of approximately zero cycles-per-second, as originally claimed in Applicant's canceled claims 11 and 17 and now claimed in amended independent claims 1, 12, 18 and 24." as recited in page 8 of remark, dated 11/27/2007.

Examiner's response –

FIG.6A of the Kawanabe represents frequency spectrum of the combining signal 117 (Fig.5) at the input of the double super heterodyne downconverters (mixers, 149 and 155).

Fig.6B of the Kawanabe represents the frequency spectrums of the combining signal 157 (Fig.5) at the second super heterodyne downconverter (mixer 155) output.

With Fig.6A and Fig.6B, it is clear that the combined of the plurality of shifted signal is further shifted to a selected frequency, centered approximately at

zero frequency (curve a of Fig.6B), at f_0 (curve b of Fig.6B), ..., $n f_0$ (curve c of Fig.6B).

Furthermore, column 9, lines 10-14, and Fig.5 of Kawanabe's reference teaches that the filter 159 removes unnecessary components of the combining signal 157 (Fig.6B curve b, ..., and curve c) on the basis of a sampling frequency in the A/D converter 161. The A/D converter 161 produces the digital signal 121.

It is clear that Kawanabe teaches the limitation of "combining the plurality of shifted signals into a composite signal centered at a selected frequency (Fig.2 elements 115, 117 and 119, and Fig.5 element 119, where Examiner considers that the double super heterodyne downconverters (mixers 149 and 155) circuit along with filter 159 is a part of the combining process circuitry to select the curve a of Fig.6B (by filter 159) as analog baseband signal.), the selected frequency is approximately zero cycles-per-second (see fig. 6B curve a, which shows the frequency of the combined signal centered at zero after passing the filter 159.) Thus, for the explanation addressed in the above paragraph, the rejection under 35 U.S.C. 103(a) with Kawanabe's reference is adequate.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 2, 6, 7, 10, 12, 14-16, 18, 19, 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawanabe (US 7,054,397) in view of Fattouche et al. (US 6,266,014).

With regard claims 1 and 12, Kawanabe discloses shifting a center frequency of selected ones of a plurality of received signals by selected amounts to provide a plurality of shifted signals located in a frequency domain (fig. 2, antennas 107-1 ..n receive a plurality of signals which are frequency shifted by 111, col. 4, lines 46-48),

combining the plurality of shifted signals into a composite signal centered at a selected frequency (Fig.2 elements 115, 117 and 119, and Fig.5 element 119, where Examiner considers that the double super heterodyne downconverters (mixers 149 and 155) circuit along with filter 159 is a part of the combining process circuitry to select the curve a of Fig.6B (by filter 159) as analog baseband signal.), the selected frequency is approximately zero cycles-per-second (see fig. 6B curve a, which shows the frequency of the combined signal centered at zero after passing the filter 159. The detailed explanation is addressed in the Examiner response in the above paragraph.), and

sampling the composite signal with a single analog-to-digital converter to provide a multiplicity of digital samples (fig.5 element 161 and 121).

Kawanabe discloses all of the subject matter as described in the above paragraph except for specifically teaching providing the multiplicity of digital samples to a plurality of digital bandpass filters.

However, Fattouche et al. teaches providing the multiplicity of digital samples to a plurality of digital bandpass filters (fig.8 element 813) in order to reject noise and interference outside of the digital IF bandwidth (column37 lines 46-47) so that the communication quality can be improved. Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the bandpass filter as taught by Fattouche et al. between the ADC 161 and each individual despread demodulator 125-1 to 125-n of Kawanabe's receiver so as to reduce the interference and improve communication quality.

- With regard claim 2, Kawanabe further discloses converting the composite signal into a plurality of digital signals (fig. 5, A/D converter 161 outputs a plurality of digital signals to signal processing portion 123).
- With regard claim 6, Kawanabe further discloses providing the series of digital channel samples to a down converter (col. 2, line 17).
- With regard claim 7, Kawanabe further discloses wherein the plurality of received signals comprises a plurality of baseband analog signals (col. 8, line 61).
- With regard claims 10 and 16, Kawanabe further discloses the pluralities of shifted signals are located substantially sequentially in the frequency domain (col. 7, lines 37-43).

- With regard claim 14, Kawanabe further discloses the composite signal includes a plurality of signals from a plurality of antennas (fig. 2, antennas 107-1..n receive a plurality of signals).
- With regard claim 15, Kawanabe discloses selecting a single sampling frequency rate for the composite signal and determining a down conversion frequency for selected radio frequency signals associated with the plurality of received signals (col. 9, line 12).
- With regard claim 18, which is an apparatus claim related to claim 1, all limitation is contained in claim 1. The explanation of all the limitation is already addressed in the above paragraph.
- With regard claims 19 and 22, Kawanabe further discloses a plurality of sections corresponding to the plurality of received signals, wherein selected ones of the sections include at least one bandpass filter and a mixer (fig. 5, 145, 149, col. 5, lines 39-42).
- With regard claim 24, which is a system claim related to claim 1, Kawanabe further discloses an omnidirectional antenna to couple to the analog stage (fig. 2, antennas 107-1 ..n). All other limitation is contained in claim 1. The explanation of all the limitation is already addressed in the above paragraph.

2. Claims 3, 8, 9, 21, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawanabe (US 7,054,397) and Fattouche et al. (US 6,266,014) as applied to claims 1, 2, 18, 24 are above, and further in view of Li et al. (US 6,639,551).

- With regard claims 3, 8, 21 and 25, Kawanabe and Fattouche et al. disclose all of the subject matter as described in the above paragraph except for specifically teaching receiving the plurality of digital signals at an interference canceller.

However, Li discloses an interference canceller for a plurality of digital signals (col. 2, line 58-col. 3, line 12). Because interference cancellation has the well known advantage of increasing signal quality and reliability, it would have been obvious to one skilled in the art at the time of invention to incorporate the interference cancellation as disclosed by Li into the invention of Kawanabe.

- With regard claim 9, the modified circuitry of Kawanabe and Fattouche et al. and Li further discloses canceling the interference present in the composite signal further comprises: reconstructing the interference present in the composite signal (col. 2, line 58-col. 3, line 12, Li's reference).

3. Claim 13 rejected under 35 U.S.C. 103(a) as being unpatentable over Kawanabe (US 7,054,397) and Fattouche et al. (US 6,266,014) as applied to claims 12 above, and further in view of Fernandes (US 5,490,134).

- With regard claim 13, Kawanabe and Fattouche et al. fail to disclose the composite signal includes a plurality of protocols associated with the plurality of received signals.

However, Fernandes discloses the composite signal includes a plurality of protocols associated with the plurality of received signals (col. 1, 38-40). Because Fernandes discloses that allowing the reception of a composite signal with multiple protocols has the advantage of backward compatibility with new technologies (col. 1, lines 14-

20), it would have been obvious to one skilled in the art at the time of invention to incorporate the multiple protocol combined signal as disclosed by Femandes into the invention of Kawanabe.

4. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawanabe (US 7,054,397) as applied to claim 18 above, and further in view of Linet al. (US 6,175,327).

□ Claim 20, Kawanabe fails to disclose the analog stage further comprises: a combiner selected 'from a power combiner, a mixer, and an adder, however, Lin discloses a signal combiner that is a power combiner (fig. 1, 28). Lin further discloses that the power combination as disclosed in his invention has the advantage of reducing interference in the received signal (col. 3, lines 17-28.), it would have been obvious to one skilled in the art at the time of invention to incorporate the power combiner as disclosed by Lin into the invention of Kawanabe.

5. Claims 23, 26, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawanabe (US 7,054,397) and Fattouche et al. (US 6,266,014) and Li et al. (US 6,639,551) as applied to claim 18 and 24 above, and further in view of Casabona et al (US 5,782,540).

□ Claims 23 and 26, the modified circuitry of Kawanabe and Fattouche et al. and Li fails to disclose an active channel controller to adjust a sampling rate associated with the analog-to-digital converter.

However, Casabona discloses an active channel controller to adjust a sampling rate associated with the analog-to-digital converter (col. 15, lines 13-14). Because the capability of adjusting the sampling rate increases the accuracy and efficiency of the receiver, it would have been obvious to one skilled in the art at the time of invention to incorporate the sampling rate adjustment as disclosed by Casabona into the invention of Kawanabe.

- With regard claim 28, the modified circuitry of Kawanabe and Fattouche et al. and Li and Casabona further discloses the active channel controller is to determine a down conversion frequency according to an activity status of a selected section included in a plurality of sections corresponding to the plurality of received signals (col. 15, lines 13-14, Casabona's reference).
- 6. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawanabe (US 7,054,397) and Fattouche et al. (US 6,266,014) and Li et al. (US 6,639,551) and Casabona et al (US 5,782,540) as applied to claim 26 above, and further in view of Fernandes (US 5,490,134).

- Claim 27, Kawanabe and Fattouche et al. and Li and Casabona fail to disclose the composite signal includes a plurality of protocols associated with the plurality of received signals.

However, Fernandes discloses the composite signal includes a plurality of protocols associated with the plurality of received signals (col. 1, 38-40). Because Fernandes discloses that allowing the reception of a composite signal with multiple protocols has the advantage of backward compatibility with new technologies (col. 1, lines 14-

20), it would have been obvious to one skilled in the art at the time of invention to incorporate the multiple protocol combined signal as disclosed by Femandes into the invention of Kawanabe.

Conclusion

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).
4. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.
5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted M. Wang whose telephone number is 571-272-3053. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2611

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ted M Wang
Examiner
Art Unit 2611

Ted M. Wang

